It is expected that this steep gradient of magnetic field is realised at the border between Weiss' domain and Bloch's wall. It is known that the thickness of Bloch's wall $\Delta\zeta$ is about 100 Å. If we assume

$$\frac{\partial H}{\partial Z} = \frac{\Delta H}{\Delta\zeta/2}$$

we have from Eq. (3)

$$\Delta H = 10^7 \quad \text{Gauss},$$

where ΔH means the strength of Weiss' field. This observed value coincides with the known strength of Weiss' inner field.

Discussion here performed is not quantal, but it is classical. Quantum mechanics may treat this problem as result of exchange force between electron spins in the incidence and those in the magnet. The author has regarded here Weiss' molecular field as real. This thought is quite similar to the Bragg's thought that regards the interplanar spacings in crystal as real.

2 THERMOLUMINESCENCE SPECTRA OF LIF

A. K. GHOSH AND B. C. DUTTA*

KHAIRA LABORATORY OF PHYSICS, UNIVERSITY COLLEGE OF SCIENCE, CALCUTTA

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Lithium fluoride bombarded with 10 KV cathode rays at room temperature fluoresces weakly and the thermoluminescence glow is too weak for spectral analysis; however when exposed to cathode rays at 90°K it fluoresces blue and on prolonged irradiation the sample becomes red luminescent. On rapid heating, the coloured sample gives two glow peaks at approximately 140°K and 650°K. The first glow is intense but of short duration while the second is weak and persists for an appreciable time. The spectral distributions of these glows have been recorded by means of an automatic rapid scanning spectrophotometer by Dutta and Ghosh (1956). The spectra of the glows are found to be different. The band maximum at the first glow peak temperature is 435 mμ (frame No. 4) while that for the second is 597 mμ (frame No. 5). During the first thermoluminescence glow, in the temperature range 122°K to 140°K, there is an indication of a weak diffuse band on the shorter wave length side of the main band. The position of this band is indicated by an arrow in the spectral record. At about 128°K to 134°K another weak band appears on the longer wave length side, its position being marked by a double arrow in the record.

*Present address: Physics Dept., Birkbeck College, London

The first glow peak temperature agrees fairly well with those obtained by Pringsheim and Yuster (1950), Ghormley (1952) and also Sharma (1952). In fact, the emission of a blue glow peak at $-135°C$, as reported by them, is found to be the first glow peak having band maximum at 435 mμ. Ghormley and Levy (1952) reported that the phosphorescence (thermostimulated) spectrum of gamma irradiated LiF is characterized by two broad bands at about 270 mμ and 440 mμ. The photomultiplier used in the present acse is insensitive below 330 mμ and hence if the 270 mμ band be present in the thermoluminescence emission it cannot be detected. The second glow peak temperature is in accordance with that obtained by Sharma (1952).

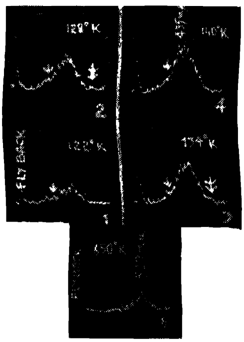

Fig. 1. Thermoluminescence spectra of LiF at different temperatures during the glow (Frames No. 1-4)

The experimental results obtained clearly show that the spectral nature of the glows is not identical. This is attributable to a process of the release of electrons from different traps at different temperatures, undergoing preferential transitions during the emission process.

A series of spectra were recorded one in each second for the thermoluminescence emission and a few of these are given in the spectral record.

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Fig. 2. Thermoluminescence Spectra of LiF at the glow peak temperature 650°K. (Frame No. 5).